



Chiropractic Care for Headaches and Dizziness of a 34-Year-Old Woman Previously Diagnosed With Arnold-Chiari Malformation Type 1



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Abstract

Objective: The purpose of this case study is to describe the chiropractic care of a patient with headaches and dizziness.

Clinical Features: A 34-year-old woman with a history of headaches, dizziness, photophobia, and temporary loss of vision aggravated by postural positions while bending forward sought conservative care for her symptoms. She reported a prior diagnosis of Arnold-Chiari malformation (ACM) type 1 by magnetic resonance imaging in 2005 that revealed descending cerebellar tonsils measured at 5 mm with an impression of ACM type 1. A new magnetic resonance image taken in 2013 indicated the cerebellar tonsils measured at 3 mm and did not project through the plane of the foramen magnum. The diagnosis of ACM type 1 was no longer applicable; however, the signs and symptoms of ACM type 1 persisted.

Intervention and Outcome: She was treated using cervical chiropractic manipulation using diversified technique. The dizziness and headache were resolved after 3 visits. At her 3-month follow-up, she continued to be symptom-free.

Conclusion: A patient with headaches and dizziness and a previous diagnosis of ACM type 1 responded positively to chiropractic care.

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Introduction

Arnold-Chiari malformation (ACM) was first described in 1891 by Hans Chiari to refer to a group of syndromes consisting of different kinds of pathologic

conditions of the posterior fossa hindbrain.^{1,2} The most common type of all the ACMs is *type 1*, defined as a downward herniation of the cerebellar tonsils through the foramen magnum.³ Arnold-Chiari malformation type 2 involves displacement of the parts of the inferior vermis, pons, and medulla oblongata together with the elongation of the fourth ventricle; type 3 involves the entire cerebellum herniation into the cervical canal; and type 4 consists of cerebellar hypoplasia.

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Arnold-Chiari malformation type 1 can vary greatly among individuals, ranging from asymptomatic to extremely symptomatic; however, associated symptoms tend to include headache, neck pain, and sensory changes, including weakness, dizziness, blurred vision, tinnitus, paresthesia, numbness and tingling, fatigue, difficulty sleeping, and other symptoms.^{4–10} Arnold-Chiari malformation is most often a congenital abnormality. Symptoms appear as the patient ages; it is more frequent in females than males with a 3:1 ratio, with an age range of 6 to 60 and a peak diagnosis age of 40 years.^{1,11}

A diagnosis of ACM type 1 is often suspected following physical examination and history. Patients often complain of headaches in the posterior-occipital area, radiating to the eyes with a pressure-type pain made worse with coughing, sneezing, or yelling.^{1,10} Confirmation of ACM can only be made with imaging, most often made by cervical magnetic resonance imaging (MRI), which is the criterion standard; however, this is also seen on brain MRI, computed tomography, and cervical computed tomography.⁸ With the increased prevalence of MRI and decreasing cost, there has been an increase in the diagnosis of ACM.⁹

Current treatment of ACM varies greatly and is dependent on the discipline of the health care provider. One of the most widely accepted treatments for ACM type 1 is surgery. Several surgical approaches may be performed, including posterior fossa decompression surgery to remove a portion of the skull to correct any bone irregularity and create additional space for the cerebrospinal fluid to flow, electrocautery using high-frequency electrical currents to shrink the lower part of the cerebellum, and spinal laminectomy to remove part of the bones surrounding the spinal canal to increase the size and reduce pressure on the spinal cord and nerve roots. Surgery eliminates symptoms in approximately 50% of cases and reduces them in another 45% of cases.¹⁰ Conservative therapy is limited to medications and physical therapy. Chiropractic care is still controversial in the management of ACM. The purpose of this case report is to describe the chiropractic care of a patient with headaches and dizziness who was suspected to have ACM.

Case Report

A 34-year-old woman sought care for headaches, dizziness, photophobia, and temporary loss of vision aggravated by postural positions while bending for-

ward. She would also experience dizziness while brushing her teeth, and she had unprovoked episodes of nausea with dizziness that would incapacitate her for 20 to 30 minutes. These episodes of nausea and dizziness would happen 4 to 5 days a week, 3 to 4 times a day depending on activity. She reported a prior diagnosis of ACM type 1 by MRI in 2005 that revealed descending cerebellar tonsils measured at 5 mm with an impression of ACM type 1. She was told by both her primary care physician and neurosurgeon to consider surgery, which she elected not to undertake. For the 3 years following the initial diagnosis, she had no medical or chiropractic treatments. In 2008, she first sought conservative treatment by a chiropractor and expressed her desire to avoid surgery if possible. She was treated for 1 month, with 9 visits using high-velocity, low-amplitude adjustments (HVLA) of the cervical spine of prone diversified manipulation to C4/C5. She reported reduction of her headaches after this treatment.

She presented again in 2013 with an exacerbation of her previous symptoms. An examination was performed; and her cervical range of motion was painful during right rotation, whereas all other ranges of motion were normal. Upper cervical spine tenderness was found at C2, and upper extremity reflexes were normal bilaterally. Based on past history, 2005 MRI, and current physical examination, her working diagnosis of ACM type 1 was made.

Prior to treatment in 2013, a new cervical MRI (Fig) was ordered before cervical manipulation was initiated to evaluate the status of the cerebellar tonsils following the initial course of chiropractic treatment due to the previous diagnosis of ACM type 1. This revealed the presence of benign tonsillar ectopia. The cerebellar tonsils measured 3 mm and did not project through the plane of the foramen magnum, so this did not meet the criteria for ACM (Fig). The new MRI results indicated that the diagnosis of ACM type 1 was no longer applicable; however, the signs and symptoms of ACM type 1 persisted. She was treated using cervical chiropractic manipulation using prone diversified technique to C4/C5; no passive or active modalities were used. The dizziness and headache were resolved after 3 visits. At her 3-month follow-up, she continued to be symptom-free.

Discussion

Some of the common signs and symptoms of ACM type 1 are headaches, neck pain, dizziness, tinnitus,

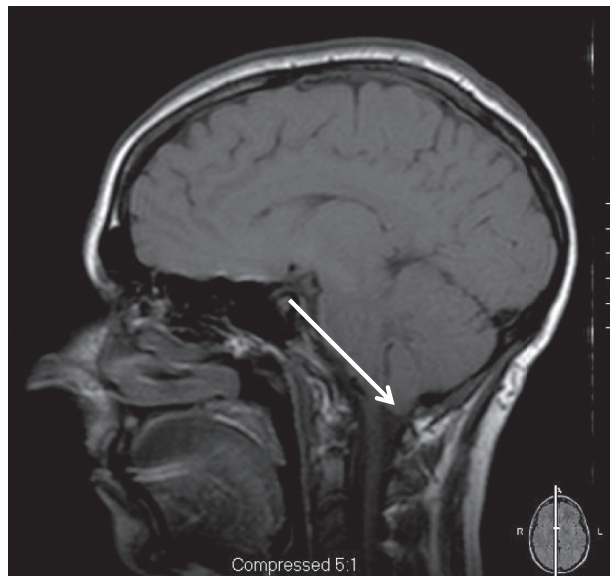


Fig. Tonsillar ectopia. T1-weighted sagittal image demonstrating the cerebellar tonsils (arrow) below the foramen magnum.

paresthesia, numbness and tingling, fatigue, and difficulty sleeping, all of which are musculoskeletal complaints that are commonly seen in chiropractic practice. A patient with any of these symptoms will most likely undergo a conservative course of chiropractic care following a history and examination.

Tonsillar ectopia may also be responsible for headaches by mechanism of the mechanical relationship between the occipital dura mater and upper cervical osseous structures and their potential to stimulate nociceptive nerves.¹¹ It is not clear how many of these patients would be diagnosed with ACM type 1 if a cervical MRI was performed on them. The majority of sources refer to surgical procedures as the main treatment for ACM type 1. Fernández et al¹² considers surgical treatment with ACM type 1 patients that are symptomatic. Patients with ACM type 1 with syringomyelia also may be recommended for surgical treatment, although this depends on the neurosurgeon's opinion.¹² One case that illustrated a successful surgical outcome was for a patient that had fallen and struck her head.¹³ She developed frequent paroxysmal episodes of lightheadedness, dizziness, photophobia, neck soreness, and occipital head pain. She was initially treated conservatively by a doctor of chiropractic, but her symptoms did not improve. An MRI was ordered, and ACM type 1 was diagnosed. She was referred out by her chiropractor and subsequently

underwent a full recovery after a posterior fossa craniectomy and a complete laminectomy of the arch of C1.¹³

The present case report describes chiropractic care for a patient previously diagnosed with ACM type 1 for the management of symptoms. With the reduced cost of MRI technology, the frequency of ACM type 1 may increase; but MRI findings do not necessarily correlate with a definitive surgical course of treatment.^{9,14} As with the conservative management of most neuromusculoskeletal complaints, imaging alone may not always dictate who might respond well to surgery; however, imaging together with clinical signs and symptoms should guide management. Few studies examine successful chiropractic management of patients with ACM type 1 signs and symptoms. In one paper, full resolution of head pain, cervical spine pain, scapula pain, lightheadedness, and visual disturbances was seen in a patient with ACM type 1 who was treated with HVLA adjustments.¹⁵

Our patient was referred initially to a neurosurgeon for management of mild ACM type 1 without syringomyelia, but the patient elected to undergo conservative care instead. Cervical HVLA chiropractic manipulation aimed at reducing the patient's symptoms of headaches, nausea, and dizziness. As with all conservative therapies, if there is no progress with the current care plan, it should be modified to include a change in protocol or imaging, with possible referral to another provider.

Limitations

As this is a case study, cause and effect cannot be suggested. It is possible that the patient may have improved on her own or in spite of care. With this case report, we were unable to control the environment of this patient. The patient may have unknowingly modified her activities of daily living, which in turn reduced her pain and lowered her outcome assessment scores. It is possible to have spontaneous resolution of ACM; thus, we cannot say that chiropractic care was responsible for improvement in her structural condition. Thus, there is the possibility of spontaneous resolution of the ACM type 1 with no influence from chiropractic care. This would mean that the signs and symptoms being treated were not necessarily associated with the ACM type 1 but were attributed to other factors.

Conclusion

This case report describes a positive outcome of a patient who had headaches and dizziness and who was previously diagnosed with ACM type 1 symptoms.

Funding Sources and Conflicts of Interest

No funding sources or conflicts of interest were reported for this study.

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